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THE PHYSIOLOGICAL EFFECTS OF HIGHLY CONDENSED AIR UPON  
THE HUMAN BODY.

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As ours is the age in which the collateral sciences of natural philosophy and chemistry, in their rapid advance, have thrown much light upon hitherto unexplained points of physiology, all facts leading toward that object should be gathered and generalized. We will, therefore, give an extract from an article, which we met with in the Archives for Mineralogy, Geology, and Mining, edited by Dr. Karsten. He describes a most ingenious and scientific operation in mining, where one element is made use of to resist another, and where human skill comes out victorious from the contest of the two elements.

The contrivance is to keep out the influx of water from a mining shaft by means of condensed air; but however ingenious and scientific this may be, it is foreign to this Journal; and we will, therefore, limit ourselves to a short description, sufficient for our readers to understand the process. The part which interests us is the effect of condensed air upon human life, that is, the effect produced upon the miners who are at work in the condensed atmosphere. The account itself, as well as the Journal in which we found it, is devoted to geology and mining; and hence, as the physiological facts are as foreign to them as mining is to us, we find a short notice only of the effects of the condensed air upon the workmen; and the explanatory reasoning on these effects, we have ourselves added.

From Doué, in the Department of Maine and Loire, to Niort, in the Department of the Nether Loire, extends a large bed of bituminous coal, known to geologists, which is covered by a layer of alluvial soil about sixty feet deep (eighteen to twenty metres). This alluvial soil consists of strata of clay and floating sand, the latter being in direct communication with the waters of the Loire itself. The difficulty of penetrating this layer of alluvial soil, and of keeping back the floating sand, which would press into the mining shaft with the weight of the waters of the Loire, with which, as just observed, it is in direct communication, had hitherto been considered as insurmountable; and, consequently, the

valuable bed of bituminous coal remained inaccessible and unavailable, until M. Triger, in connection with M. de Las Cases, proposed to force the water back by means of condensed air. To accomplish this object, they adopted the following plan :

A cylinder of sheet-iron about seventy feet long (twenty metres), and about three and a half feet (1.033 metre) in diameter, was forced through the sand till it reached the bed of coal. The upper end of this large cylinder is closed by a box, with two valves large enough for a man to pass through ; and this contrivance is for the purpose of letting the workmen pass in and out, without allowing the condensed air to escape. The rest of the apparatus consists of air-pumps, which are steadily worked by a steam engine. By means of the air-pumps, the sheet-iron cylinder and the shaft, which latter commences where the former terminates, are filled with condensed air, which is always kept equal to a pressure of three atmospheres, or equal to forty-four and a quarter pounds to the square inch, which presses the water back, and keeps cylinder and shaft dry.

Without entering further into the details of the apparatus or its operation, we think we have said enough for our readers to form some idea of both. Suffice it to add, that the practical results fully answered the expectations, and that the success was complete.

We now come to that part which interests us most, viz., the effect of the condensed air upon the workmen and miners exposed to it ; and we regret that this part of the account is as meagre in the eyes of the physiologist, as probably our description of the apparatus would be unsatisfactory to a civil engineer or a miner ; for, as we said before, the facts are briefly stated, and we have added the explanatory reasoning without presuming, however, that ours is the only mode of explanation. Others may find a different, and perhaps a better theory.

The first phenomenon which was observed when the men entered into the condensed air, was a more or less severe pain in the ears. This pain commences immediately on entering into the compressed atmosphere, and ceases as soon as an equilibrium is established between the condensed air and the air which is contained in the interior of the ear. This explanation appears the more probable, as the pain was easily removed by the act of deglutition. In some of the workmen, this pain in the ears was so slight as to be hardly perceptible, while in others it was very intense. With others, again, it did not exist at all in entering into the condensed air, while it became very severe on leaving it, and getting out into the open atmosphere ; the latter case was, however, of rare occurrence. A certain bodily disposition seemed to exert some influence upon the degree of pain which the men experienced, as the same person would one day feel it only very slightly, while at other times, apparently under the same circumstances, the same person would suffer intensely. Besides, the fact was established, that the pain would be lessened in proportion as the transition from the open air into the condensed, and from the condensed into the open air, was slower and more gradual.

Another singular observation which the workmen made was, that nobody was able to whistle in condensed air under a pressure of three atmospheres; but until the condensation reached that point, viz., the pressure of three atmospheres, the men were enabled to whistle. This phenomenon we explain in the following manner: In whistling, we force a stream of air through a small aperture of the lips; and this fluid, in thus passing through this small aperture, becomes condensed, and produces the sound; but under a pressure of three atmospheres, the air is already so condensed that the ordinary effort, which the muscles of the cheeks and lips and the respiratory muscles are accustomed to make for the purpose of whistling, is not sufficient to compress the air any farther; and consequently there arises an inability to whistle. The account we have does not mention anything on the subject, but we suppose there would be a similar difficulty in expelling air *per anum*.

Another fact observed is, that in this condensed air, *every body speaks through the nose*. The following theory may explain this fact: The common expression, to speak through the nose, is a misnomer, being like *lucus a non lucendo*; for the sound becomes nasal (we speak through the nose) when, in articulation, the air and sound do not pass freely through the nose. Now, as the animal heat in the interior of the nose probably rarifies the air a little on its passage through that cavity, the surrounding air is slightly more condensed than that within the nose; and the pressure from the outside is consequently stronger in proportion to the rarification of the air within the nose. The slightest pressure on the nose is, indeed, sufficient to give to the voice a nasal sound, which we easily perceive by merely laying a finger gently on each side of the nose. On the other hand, it is also possible that this phenomenon is produced, not by the action of the condensed air on the speaker, but on the hearer.

Though we might be led to anticipate some decided effects upon respiration from the exposure of the lungs to this condensed air, the account does not mention any change produced in respiration, except one phenomenon, which we should have least expected, namely, that the workmen, in ascending the shaft filled with condensed air, did not lose their breath, or did not become short of breath, to the same degree as when making a similar ascent in the free air. The only explanation we can suggest of this fact is as follows: As the same given volume of condensed air of course contains a greater quantity of oxygen than the same volume of uncondensed air, it follows that the lungs require, in proportion to the condensation, a smaller volume of air to effect the oxydation and decarbonization of the blood; and that they consequently do not require to be extended as much as if they were breathing uncompressed air, nor need the action of the respiratory muscles be as energetic.

May not this fact, if carefully investigated and fully established, warrant the practical application of condensed air as a remedial agent in certain diseases; for instance, in some kinds of asthma, or some affections of the lungs, in which these organs have become partly impermeable to the air, or even in morbus cœruleus? Even if we could not expect to

cure those diseases by the breathing of condensed air, yet it might be a means of prolonging life. A small volume of condensed air would introduce a sufficient quantity of oxygen to be mingled with the blood, without the objectionable excitement produced by the inspiration of an uncondensed air, which contains a greater and an artificial proportion of oxygen. We are fully aware that a merely speculative idea, thrown out in this way, is open to a great many formidable objections; and it would carry us far beyond our limits to enter here into a discussion *pro* or *contra* on this subject; but if we mistake not, some years ago a physician in Paris had an apparatus arranged for applying condensed air as a remedial agent, though we do not at present recollect where or whether we ever have seen a satisfactory account of his experiments, nor do we recollect the name of the physician.

The last and most remarkable fact which we find stated in the account before us, among the effects produced by the condensed air upon the workmen, is the following: One of the miners, a man by the name of Floe, who had been deaf since the siege of Antwerp, always heard better in the condensed air than any of the other miners who were not deaf. We regret that we only find this brief statement of the bare fact, without mentioning anything of the nature or cause of the man's deafness, precluding thus any conclusions at which we or our readers might have arrived. It might be that the cause of deafness was an obstruction of the Eustachian tubes from thickening of the lining membrane, which was temporarily removed by the pressure of the condensed air. But why then should he hear better than any of his companions, who were not deaf? for the comparison which is made seems to imply that the hearing of those who were not deaf became imperfect in condensed air. It must, therefore, have been a cause which, while it affected a sound ear, temporarily restored a diseased organ. May not condensed air act as a stimulus upon the organ of the ear, which, while it is too powerful for a sound ear, excites to action an organ perhaps partially paralyzed, which requires an artificial stimulus—a result analogous to the fact, that a person suffering from nervous deafness hears better in a noisy place; as, for instance, when riding in a carriage? Or does condensation alter the sound-conducting property of the air? Are the vibrations of condensed air more intense or less so than those of the air when under no pressure?

The account farther mentions some interesting observations belonging to the province of natural philosophy; as, for instance, the increased rapidity of combustion, which, under a pressure of three atmospheres, increased so that they had to abandon the ordinary candles with cotton wicks, which, burning out in less than a quarter of an hour, made so intolerable a smoke that they had to exchange them for candles with linen wicks, which lasted longer and did not smoke so much. We will, however, not go beyond our province; but in conclusion we cannot refrain from adding, that in the session of the Academy of Science of Paris, of November 8th, 1841, Dr. Poisenille mentioned some experiments which he had made on the effect of high atmospheric pressure



upon animal life. Having exposed salamanders and frogs to a high pressure, he found that it produced no change in the capillary circulation, even when the pressure was equal to seven atmospheres. He observed the same upon some mammalia: having exposed mice and young rats for a whole hour to a pressure of seven atmospheres, or one hundred and three and a quarter pounds to the square inch, he observed that they moved about and fed as usual, as soon as they came out of the pressure into the open air.—*N. Y. Jour. of Med. and the Collateral Sciences.*

#### NON-RESTRAINT OF LUNATICS IN ENGLAND.

[Communicated for the Boston Medical and Surgical Journal.]

It is known to our readers, that for two or three years past no little amount of attention has been drawn, by the laudatory remarks in newspapers and Reports, to the plan of treating lunatics in asylums and hospitals without the use of what they in England seem *technically* to term *restraints*. The idea is, not that the locks are taken from the doors, the keepers removed, and "moral suasion" alone resorted to; it is not that any new magic mean has been discovered to "mesmerize" or otherwise pacify the being void of self-control; but simply this, that apparatus applied to the person, or the limbs of an excited maniac, is disused. Its place is supplied by a greater number of keepers (attendants, as they are called in this country), by seclusion in rooms furnished with an "inspection plate," that is, a hole in the door through which the patient can be observed, and by locks to keep on his clothes, boots, &c.

It is well known that the insane in the hospitals of England have been treated far behind the age. The annual report of the director of one of our Massachusetts asylums, as late as 1840, represents that he saw chains to the beds of a long dormitory of St. Luke's Hospital, one of the oldest and most distinguished in Great Britain. It is to be regretted that in bringing their system up to the standard, they had not avoided the common error of reformers and new converts, that of affecting and perhaps believing themselves to have reached nearer the heaven of perfection than a fair view of facts will sanction. So far as they have got rid of strait-waistcoats, handcuffs, chains, and all those repulsive and unnecessary adjuncts, they have done well. But when they attempt to hold out the impression that they have made any new advances in the art of treating lunatics, by giving the name of entire abolition of restraints to the measures, mitigated to be sure, adopted in their place, they may deceive themselves, they may deceive the public, but of this they may be sure, they will not deceive the insane themselves. It is essentially a misnomer, and the attempt to restrain a dangerous insane man in one of our asylums by locking him up in a strong room with a small hole through a plate in the door, from which ever and anon he would see the eye of his keeper glaring in upon him, might naturally enough bring to his recollection the stanzas of one of our democratic distiches:

"If we cannot alter things,  
By — we'll change their names, sir."

To attempt to abandon wholly all restraining measures, to tie one's own hands against their use under all circumstances, is to cut off the power of acting in accordance with one's best judgment. It is of the same form of absurdity as that which actuated some of our ultra-temperance practitioners a few years ago, in their denouncing the use of alcohol under any circumstances in their practice.

It is highly commendable to attempt to reduce the entire measures requisite for the treatment of the insane, not only restraints of members, but seclusion, interdiction of friends, &c., to their lowest point, consistent with the great objects to be attained, safety and restoration. But nothing is farther from the principles of good sound common sense, than to deduce the conclusion that because the least practical amount of a mean is always desirable, none at all is still better. Yet this is a principle often adopted by a certain class of minds, where a sanguine bias, a desire of originality, or incapacity of just ratiocination, predominates. For example, it is admitted that practitioners of the highest stamp ordinarily use the least amount of medicinal agents; of course, a still higher step is to adopt homœopathy, or, what is equivalent, use none at all. The best schoolmasters use the least corporeal punishment; to be still better, announce to your scholars that you have abolished that remnant of barbarism. The best codes of criminal laws enforce the punishment of death the least; therefore advance a step higher, and abolish it entirely.

This is much the reasoning, we apprehend, of those individuals who have attracted some attention in England by their advancing a last step, as they would fain have it appear, in the already far-reached progress of insane asylums, and announce that they use no restraints. The idea conveyed is not the real one to a very great extent, because one form of controlling the sufferer is substituted for another. As far as it is real, it is to be dreaded. An awful illustration of this is conveyed in the reports of Dr. Conolly, of the great pauper lunatic asylum at Hanwell, near London, a re-publication of whose annual reports for the last three years is before us, having accidentally reached us by the hand of a friend. It would seem that this attempt to lay down a general rule for the guidance of a public hospital, that restraints upon limbs should never be used, was commenced at the Lincoln Lunatic Asylum in 1837, and was followed at Hanwell some two or three years later. At the Lincoln Asylum, where one extreme, that of unheard-of restraint, as we should judge by the table, p. 20, of Dr. C.'s report, was succeeded by the other, that of no *personal restraint* (meaning, as the use of the term always does in these English reports and discussions on this topic, merely apparatus to the person, and not seclusion, guarding, watching, &c.), it would seem that this plan, like all ultra measures, has naturally reached its just mean again; a note to page 66 of this report speaks of its being understood that restraints, after a long discontinuance, have been resumed at Lincoln.

The painful comment on a system of absolute disuse of all bodily re-

straints referred to, is found in the account of the death of an aged man caused by injuries inflicted by another patient, as pronounced by the coroner's inquest, page 134, and by the instance detailed on page 166, where "the attendants were set at open defiance, and one of them was severely hurt by a patient just received." The recent items copied into our newspapers from those of England, contain also a most striking and tragic account of a visiter, whether patient or not did not appear, at this institution, who threw herself from a window in a suicidal paroxysm; she was seized by Dr. Conolly, held by the arm, while his cries for assistance were fruitless, until she slipped through his exhausted grasp, and fell into the area, a distance of seventy feet, if we recollect aright, producing, of course, instantaneous death!

Now we will not say that these examples of sad accident were the natural or necessary results of an attempt to curtail the use of restraint beyond a judicious degree. All institutions are liable under the utmost vigilance to occasional mishaps; and the medical man who has numbers of lunatics under his care would presume on his good luck if he felt himself removed from the danger of occasional accidents. But we will say that we never knew of a single accident equalling in degree of horror either of these, to have occurred in all the institutions in New England, since the period of their foundation. They at least have that suspicious character which should make an upright and conscientious man stop and inquire of himself whether he may not, in correcting some abuses, fall into more afflicting troubles. Many *hobbies* may be very innocently ridden, and ridden to the death, without hazard or harm. In regard to abolition of the punishment of death, correction in schools, and bodily restraints among lunatics, a good maxim is, "*festina lente*."

Medio tutissimus ibis.

The anecdote of a conscientious miller in Connecticut, illustrates more than the danger of sudden changes in the abolition of slavery. He increased the height of his dam until his neighbors, with one accord, protested that they should all die with fever and ague, if the country were so inundated with his back water. Impressed with the soundness of their complaint, he at once hoists his gate, knocks out a few planks, and abates the nuisance by "immediate and entire emancipation" of the element. The consequences to those down stream may be well imagined.

These reports of Dr. Conolly, we regret to see, are written with a tone of self-elation, a disposition to place himself forward as a great and successful innovator in the matter, which we should not have expected from the character of his previous writings, which, if not always very solid, were at least in good taste. Every page almost repeats the story, often in Italics, of "the *entire disuse* of restraints," "the *total abolition* of bodily restraints," while an American at least is surprised in the same pages to find, as at page 21, that "strong dresses are provided, secured round their waists by a leathern belt, fastened by a small lock." "For some who destroy the collar and cuffs of their dresses with their teeth, a leathern binding to these parts of the dress is found convenient." "Va-

ried contrivances are adopted, with variable results, for keeping clothing and boots on those who expose themselves." "As it is now and then necessary to *confine the hands* when a blister is applied, to prevent its removal, and as this, like all other temporary restraints applied with the justifiable plea of protection, is generally abused by being too much prolonged or unnecessarily severe, a kind of cape" has been thought of. "Those who are in the habit of striking suddenly, tearing the bed-clothes, &c., sometimes wear a dress, of which the sleeves terminate in a stuffed glove, without division for the thumb and fingers." Although we find subsequently that this last appliance was discontinued from its clumsiness.

Let us look at the principal substitute for these restraints, which appears to be seclusion, which is adopted and printed as a technical term, *seclusion*, or shutting up in a strong room. That this is the substitute, is obvious from the printed form of register, in which the columns formerly headed "Number in Restraint," and "Length of Time in Restraint," now are changed to "Patients in Seclusion," and "Length of Time in Seclusion." To judge from the phraseology of some parts of these reports, one would suppose that all measures beyond "moral suasion" were unnecessary cruelty. But on referring to page 70, will be found a description of the mode in which a violent patient should be put in seclusion. It is in fact no more than that "three or four attendants, possessed of courage and good temper," should surround and put him in his room. "The window of his room should in all cases be secured by an efficient shutter and lock. The bedstead, which should be of wood, should be fastened to the floor and remote from the window. Sufficient light should be admitted through *holes* made in the window *shutter*, to enable the attendants, by looking through the inspection plate in the door, frequently to ascertain the state of the patient."

We should like to have the opinion of one experienced in the treatment of the insane, as to the relative wound to the self-respect of a patient in this mode of procedure, and in the administration of those means such as the application of large mittens, or the leathern muff, which are occasionally, although but rarely, employed in our New England institutions.

Again, in the case of patients disposed to suicide, we learn (page 135) that they are "more generally put into rooms where other patients sleep—a measure *always advisable, if the patient is not noisy or violent.*" We know not how this idea might be acceptable to the English public in case of one of those accidents, which the history of insane patients trusted together, cannot fail to furnish, but have no hesitation in saying that we believe that a superintendent at one of our asylums, even for the lowest class of paupers, would have speedy leave to retire to private life, if he should be known to sanction such a proceeding, as that two lunatics were locked at night in a room together. To say nothing of the danger of life, which any one experienced in the occasional sudden changes of the form of insanity from mild to severe, the liability to

occasional outbreaks of secret malignity or capricious mischief, of those externally pretty well, will not undervalue, there are other objections which will be easily conceived.

At this very institution at Hanwell, Dr. Bagley, an assistant physician, informed a friend of ours in 1840, in speaking of the terrible necessity they experienced of having many patients in one dormitory, that the constant commission of offences not to be named, could not be avoided, and were habitually practised. Better that chains, coercive chairs, strait-waistcoats, *leg locks*, and the other apparatus, the very names of which have not yet reached this side the Atlantic, should be employed, than that such horrors as these should be endangered!

The true doctrine in relation to the use of restraint, including under this term not merely bodily restraint, but seclusion, guarding, and the like, appears to us as simple, plain and unanswerable, as any point of common sense in ordinary dealing.

First, to avoid them all, as far as consists with the safety of the patient and those around him. If he be disposed to active suicide, to self-mutilation, to impulsive acts of violence, or if his disease demand a horizontal position (as is most valuable in delirium tremens, exhausting standing up from insane apprehension in a feeble and exhausted sufferer), the apparatus employed to retain him in bed, and still allow him a free power of changing position, or the muff or mittens when he is up, are found to be most efficacious and unobjectionable. A second rule is, that all and every form of restraint and seclusion should be applied only under a responsible officer, who will exert his own judgment of its necessity and extent. This rule infers in its application the immense advantage, if not the absolute indispensableness, of a moderate number only of patients in an institution. *If we regard anything as settled beyond a doubt, from a vast many reasons, it is that no institution should congregate more than from one to two hundred subjects*; this forms as large a body as one single director can or ought to be responsible for, and will leave but few occasions for delegated authority in matters of moment. A third circumstance should be, that no restriction should be put upon the head of an institution as to the employment of any number of suitable assistants, at any price that may be necessary.

With these qualifications, there can be little or no danger of personal liberty being unduly or unwisely infringed in an institution for the insane.

There are two remarks in these reports of Dr. Conolly, touching the asylums of this country, which deserve a passing remark. At page 118, where the Resident Physician "may refer to the liberal manner in which the attempt [to abolish restraint] has been received at Glasgow, at Montrose, at Stafford, and by the Directors of the Retreat at York, *as well as by physicians of asylums in America*," &c. That this or any other proposition or suggestion from so eminent a physician as Dr. Conolly would be received by any director of an insane hospital in America with consideration and respect, is certain. If it is intended to intimate that any idea of changing the means employed at present, for such forms of restraint as this Report describes, has been broached, or has ever been

thought worth the trial, in any institution of our land, we, with considerable acquaintance with the management of many of our institutions, must be allowed to doubt. Even if we should happen to have any hospital superintendent who could be seduced into the attempt from any faith in its truth, or from the newspaper applause which might accrue, he would probably pause, after a knowledge of the sad results to which we have referred.

The other objectionable observation referred to, is on page 174. "In several asylums, *where as yet it has not been found practicable* to discontinue restraints entirely, they are spoken of as being seldom resorted to. At York, Ipswich, Dumfries, Belfast, Clonmel, and in the asylums of Worcester, Bloomingdale and Massachusetts [McLean Asylum] in the United States, this testimony has been distinctly given." "*Found practicable*"! The phrase *found wise, judicious and safe*, would express much nearer the views of those gentlemen, who have been placed at the head of our few, but unsurpassed, institutions. They probably, even in comparison with the boasted abolition of all bodily restraints as in these foreign asylums, may console themselves with the belief that in actual freedom from measures of irritating interference (including generally personal restraint, seclusion, or coercive measures), they have gone further than those of other countries. They may also rejoice that no morbid oscillation of the pendulum of public opinion, thrust far from its equilibrium on one side, by undue severity within their institutions, requires it to pass the bounds of truth and judgment on the other, before its true position is acquired.

#### PROSPECTS OF NAVAL SURGEONS.

[Communicated for the Boston Medical and Surgical Journal.]

As the inquiry is frequently made by our young medical men, into what prospects the situation of Assistant Surgeon holds out to them, we think that the following letter may not be uninteresting or unimportant. It was written some eighteen months ago, by an Assistant Surgeon to a friend of his, a Commander in the Navy.

Dear ——. \* \* \* When asked, some months since, by a friend, for my advice as to entering the Navy as an Assistant Surgeon, I told him that had I the choice, I would rather be struggling amidst all the privations that every young professional man without means has to endure, than enter the Navy as an Assistant Surgeon with the prospect of remaining in it for life.

Now do not suppose that any privation of personal comfort would make me come to this conclusion. Those that know me can bear witness that I can endure with the best, can eat salt grub and hard tack as well as any, and indeed it would appear affectation to say how perfectly at home I feel on board ship, and how acceptable all my duties are. It is from other causes that my dissatisfaction, or, to use the proper term, my



disgust, proceeds. These are, the present want of protection of the Assistant Surgeons by the rules and regulations of the service—the degrading footing upon which common usage places them—the total disregard of the dignity of their profession, the extent of their acquirements, or the inherent respectability of their calling, which is shown by other officers.

After spending some three years in acquiring our profession, expending labor and money upon it, we pass an examination which entitles us to a commission. The character of that examination, its strictness and impartiality, are well known. Seldom more than one third of those that present themselves for this examination pass it—often not that proportion. It puts our medical attainments beyond question. In running over the list of Assistant Surgeons, I find there are but twenty-seven that I know. Of these, nine (one third) would anywhere be called men of accomplishments. One is a fine scholar and naturalist; a second is well acquainted with four modern languages, has built a steam engine, and shows considerable talent in mechanics; a third is an accomplished musician; two, besides being read in five modern languages, are scientific musicians; another is one of the best read men in English literature of his years that I know of, besides a classical scholar; another, with a classical education, is a scientific musician, and draws as well as any amateur I know. I speak nothing of a mere knowledge of French and Latin, for these all ought to have, and in giving these instances I have rigidly avoided exaggeration. Now let me ask, how much is there in the situation of officers of our grade, with such acquirements, to make them satisfied with their condition? They come on board ship fully qualified for the exercise of their duty, yet are associated with boys perfectly ignorant of theirs. They have a commission which requires the approval of the Senate; yet it confers no right that the midshipman who was at school learning to read two days before, may not dispute, and victoriously too. They are not permitted to bear that commission until they are of age; yet a boy who has not got over the whims and caprices of childhood may exert those very whims and caprices to the discomfort of a man whose attainments have been tested and stamped with a high value by a rigid examination—attainments for which he has possibly expended all his little means, and given up his youth to privation and toil—and which redound to the credit of the service.

It may be asked, why do men remain in the service under such circumstances? Why, many cannot help it; myself, for example—others are for a time by chance fortunately situated, as I happen to be just now, and the chain does not gall—and then, getting broken in, or broken down, they find it too late to resign. For myself—on shore I enjoy a social position which I have every reason to be well satisfied with, and which (and I say it without vanity) I have obtained, or at least maintained, for myself by my acquirements, such as they are; yet in the Navy, what does this avail me? Have I a single honor shown me which is not shared by a midshipman who cannot speak good grammar? Last cruise I was under an illiterate Commodore and narrow-minded 1st Lieutenant (and I may be again)—made to wait in a boat for a ward-room mess boy—hav-

ing the attempt made to force me to take my meals at the same hours with the men—and subjected to many like annoyances worthy the source whence they sprung. Treated thus by those highest in command, reduced by them to the level of the forward officers, my relations with others could not be more favorable, and the picture is not overdrawn nor indeed half filled up.

I have escaped the service in a Sloop of War, where an Assistant Surgeon, with his disposition to study, is thrown into a steerage without a spot he can call his own; forced to sit at table with a set of unruly boys, whose noise and uproar he is never for a moment freed of; his books made a laughing stock, his habits of study ridiculed and broken in upon; while a boatswain, who cannot read, and who has been accustomed all his life to sleep in a hammock, has, as well as each of the forward officers, a state-room to himself. In looking forward, I find that though the entrance into the ward-room gives certain outward marks of honor, such as a pipe at the side, &c.—things to me of no value—yet it gives no increased respectability of station. The purser, a mere accountant, has more deference shown him; and the lieutenant who got his commission yesterday, and who without it might be a mere cypher, takes precedence over a Surgeon of the Fleet, gray in the service of his country, to which each year he may have added more credit and reputation. I have an instance of this in our present Surgeon—a man of great acquirements, well read in German, Spanish, French and English literature—a classical scholar, and highly perfected in all manly accomplishments, yet scarce receiving what would gratify the feelings of a third-rate school-master.

Now do not suppose that I have any absurd idea of what the privileges of a Surgeon should be, or that I think an Assistant Surgeon should step into all the honors that long-trying and faithful service entitle a man to. For an Assistant I ask (and I ask it in the name of their well-founded and well-proved professional knowledge, and in the name of their ability by such knowledge, and by their accomplishments, to do credit and bring honor to the service to which they belong) honors in common with other commissioned officers—an assimilated rank with masters—a seat at the ward-room table on board Sloops of War—a state-room out on birth-deck of ships of that class, where he may have some chance of at least retaining the knowledge with which he entered the service. For a Surgeon I would ask an assimilated rank (as in the army) with lieutenants, taking rank by date, and proceeding through the grades of commander and captain. Now all this would give me no higher an estimation of myself than I have at present. It would not make me feel myself a greater man or a more learned physician; but it would show to others that my attainments were legally respected, and it would put me above the whims and caprices of men infinitely beneath me in intellect and acquirements. At present, what inducement have I in the service to exert myself? Were I as learned as Louis, or as fine a surgeon as Dupuytren, would it benefit me one particle in any possible way? I have no *esprit du corps*; I have never had anything to give it me. I am by

law or by usage the companion of boys and forward officers. Officers of other grades do not look upon me as one of themselves, and I have nothing in common with them. The time has gone by, if ever it was, when I felt that I *gained* honor by being in the service. I can say in truth, with nearly every one of my corps,

"My office lends me no grace  
I do not pay it back."

We do more credit by far to the Navy than it does to us; and in return I ask of government merely such outward marks of respect as are due to the professional and other attainments which we are acknowledged to possess.

#### CHEMICAL ANALYSIS OF THE HOT SPRINGS OF VIRGINIA.

[SINCE the publication of an article, three weeks ago, on the Hot Springs, the results of our personal observations on the spot, the following communication has been received from Dr. Goode, to whom we tender our thanks for past kindness and civilities.]

There are seven baths at this place, four of them spout, each supplied with water from a separate spring, and of the following temperatures:—one of 98, one of 100, two of 102, and three of 106. The effects of these waters in various chronic diseases, prove that they possess the most decided medicinal powers, though they are considered by many as simple hot water. They have been critically analyzed by Professor Wm. B. Rogers, of the University of Virginia, and according to a late communication from him upon the subject, the saline ingredients in 100 cubic inches of the water are as follows:—

Carbonate of lime	-	-	-	7.013
Carbonate of magnesia	-	-	-	1.324
Sulphate of lime	-	-	-	1.302
Sulphate of magnesia	-	-	-	1.530
Sulphate of soda	-	-	-	1.363
Chloride of sodium and magnesium, with a trace of chloride calcium	-	-	-	0.105
Proto-carbonate of iron	-	-	-	0.096
Silica	-	-	-	0.045
The free gas consists of Nitrogen			83	
Oxygen gas			10	
Carbonic acid gas			7	

The effects of these waters, when drank, are such as we might expect from our knowledge of their *ascertained* constituent parts. But the chemical composition of a mineral water can lead to no safe conclusions as to its full medicinal powers. Its most potent part may be incapable of analysis or destroyed by the process, and its mere properties cannot be developed by analysis. Our only sure test is experience of the actual result when applied to the *diseased* human system. I have resided at

the Not Springs for ten entire seasons, and watched their effects on several thousand invalids with all the interest which ownership and a sincere sympathy for suffering humanity could excite, and the results of my observations are these. When taken internally, they are anti-acid, mildly aperient, and freely diuretic and diaphoretic; but when used as a general bath, their effects are great, and exceed all reasonable expectation. They equalize an unbalanced circulation, and thereby restore to different important parts of the system, when torpid, that natural and peculiar sensibility, upon the existence of which their capacity to perform their respective functions, and the beneficial action of all remedies, depend. They relax contracted tendons, excite the action of the absorbent system, promote glandular secretion, exert a marked and salutary influence over the whole biliary and uterine systems, and often relieve in a short time excruciating pain caused by palpable and long-standing disease of some vital organ.

#### STATISTICS OF CANCER.

M. TANCHOU has lately brought under the view of the French Academy of Sciences a very elaborate paper on the relative frequency of cancers, from which the following statements are extracted:

From 1830 to 1840 inclusive, there died in the department of the Seine (city of Paris and arronds., Sceaux and St. Denis) 382,851 persons; namely, 194,735 males, and 188,116 females. Of these deaths, 9118 were from cancer; 2161 in males, and 6957 in females. The deaths from cancer\* were irregularly progressive throughout this period, being 668 in 1830, and 889 in 1840 (a circumstance, doubtless, attributable in part to increase of population, but according to M. Tanchou only partly so). The deaths from this cause were mostly in the city of Paris; in which 7999 individuals had deceased from cancer within the eleven years mentioned, making a proportion of 2.54 per cent. to the total deaths; while in the arronds. Sceaux and St. Denis, the deaths in the same period were only 1119, or 1.63 per cent. of the whole. The following table shows the influence which age has on the development of cancer.

Age in years.	Deaths from Cancer.	Males.	Females.
From 1 to 10	23	9	14
10 — 20	26	13	13
20 — 30	231	62	169
30 — 40	1012	190	822
40 — 50	1975	339	1636
50 — 60	2108	488	1620
60 — 70	2067	598	1469

\* Under this term are included not only the disease to which the name cancer is strictly applied, but scirrhus of other kinds, osteo-sarcoma, encephaloid tumors, noli-me-tangere, sarcocoele; in short, all descriptions of malignant growths.

Age in years.	Deaths from Cancer.	Males.	Females.
70 — 80	1315	398	917
80 — 90	335	62	273
90 — 100	26	4	22
Total	9118	2165	6955

M. Tauchou found, in the above cases, the relative frequency of the disease in different parts to be as follows :

Seat.	Cases.	Seat.	Cases.
Uterus - - -	2996	Thorax, arm-pit, thyroid gland (each) - -	8
Stomach - - -	2303	Scrotum, groin, lungs, colon (each) - - -	7
Female breast - - -	1147	Head, heart, arm (each) - -	6
Liver - - - -	578	Epiploon, prostate, hand, male breast (each) - - -	5
Rectum - - - -	221	Forehead, shoulder, throat, ear, pharynx (each) - -	4
Abdomen - - - -	188	Kidney, parotid gland, tonsils, larynx, palate (each) - -	3
Intestine - - - -	146	Temple, chin, cæcum, vulva, &c. (each) - - -	2
Bladder - - - -	72	Cranium, cerebellum, retina, orbit, æthmoid and mastoid bones, sternum, pleura, peritoneum, female urethra, &c. (each) - - -	1
Face - - - - -	71	Cancers without specified seat - - - -	*829
Mesentery - - - -	66		
Ovary - - - - -	64		
Tongue - - - - -	36		
Eye, jaw (each) - - -	24		
Brain - - - - -	28		
Testicle - - - - -	21		
Lip - - - - -	16		
Vagina - - - - -	14		
Spleen, anus, œsophagus (each)	13		
Nose, mouth (each) - -	11		
Thigh, penis (each) - -	10		
Leg - - - - -	9		

The population of Europe appears to be much more liable to cancerous degeneration than that of other parts of the globe. It is said that traces of such disease have been met with in Egyptian mummies, while Clot Bey, and other medical authorities, have stated that it is never met with among the indigenous population of Egypt in the present day, but only among the Turkish women of the country, and in them but rarely. In the East generally, it is affirmed to be much more prevalent among Christians than Mussulmans. Rozet says it is very rare in the north of Africa; Bac asserts the same as respects Senegal; and several practitioners in the French possessions in Algiers have never seen it there. From these and other facts M. Tanchou forms his conclusion that cancer is the more frequent in proportion as civilization advances, and other conclusions to which he has arrived are the following :—

\* These are supposed to have been principally cancers of the breast, which, therefore, might stand in the table as 1361, a number comprising cancers in the breast in both sexes.

That the cause of this disease prevails throughout the whole economy, but *more especially in the fluids than in the solid constituents of the body*. That, though in the present state of medical science the treatment of cancer must remain empirical, the disease admits of cure in certain cases. That there is no method of treatment uniformly adapted to all cases; and that there is no known specific for cancer.—*Gaz. des Hôpitaux*.

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## THE BOSTON MEDICAL AND SURGICAL JOURNAL.

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SEPTEMBER 20, 1843.

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*The Saratoga Springs.*—Those who have gone the entire round of the principal mineral waters of the United States, give, on the whole, a decided preference to those of Saratoga. Invalids, especially, manifest their partiality very plainly for these fountains. If they ever were valuable, at any past period, they have been essentially improved of late, according to Dr. Chilton's recent analysis. The old Congress spring is certainly improved, and is superior to all others in that neighborhood. It now contains less iron, by a great amount, than formerly, and more iodine and bromide; and since all fresh water has been excluded by the new curb, a forcible cathartic power is acknowledged by strangers. Nothing, in fact, can resist the feeling evidence of its activity; and yet not a single day's education of the gastric organs is necessary to render the water palatable. No nauseous sulphuretted hydrogen is to be forced into the stomach against the permission of half the guardian senses.

The annually increasing attractions of Saratoga exert an influence of a wholesome character. Who could resist the thrill of delight that takes uncontrolled possession of the multitude, every pleasant morning, while two bands of musicians are exerting themselves over some of the sweetest airs that ever were composed? The various and amusing costumes presented to the eye, as group after group presses towards the spring; the salutations of acquaintances; the various attitudes; the laughing, groaning, and limping; together with the echoes of the sweetest musical tones, and an atmosphere charged with vitality, give, in our estimation, a finish and a crowning glory to Saratoga. There would be no end, were we fully bent on details, in regard to the liberality of Dr. Clark, the proprietor, or the keeper of the Pavilion, to whom the public is greatly indebted for these increased and refined enjoyments. More than one thousand new lodgings have been provided in Saratoga, in addition to those existing about five years ago. Full 4000 persons are assumed to have been steadily on the ground the present season. Expenses range from \$2 to \$12 per week, and hence all classes of persons are sure to be well provided for, and at a fair rate.

It is an essential advantage at all the principal springs, lately, that experienced, scientific physicians have established themselves near by, whose study it is, from season to season, to watch the effects of these powerful



mineral agents, both on the internal and external surface. From an examination of Dr. North's case book, extracts from which appear in this Journal nearly every year, it is evident that there is no falling off of medical consultations. The same remark is applicable to Dr. Moorman's and Dr. Johnston's memoranda at the White Sulphur, and Dr. Goode's at the Hot Springs. From a personal knowledge of the true state of things, we feel greatly confirmed in the opinion, long since advanced, that physicians should impress upon the patients whom they send to the springs, the necessity that exists for having the advice of these resident physicians. They should be discouraged from the adoption of any plans of their own in regard to the use of the water. It is the ambition of these resident practitioners to return the invalid to his family physician so much revolutionized by a judicious use of these waters, as to render the remainder of his convalescence an easy matter. We have found indubitable proof of the skilful and honorable treatment of strangers, who seek advice, which is exceedingly gratifying to the sick, and creditable to the character of the profession.

Such are the facilities for reaching Saratoga, with comfort and rapidity of movement, so unlike the snail pace and expense incurred in getting to our other fashionable springs, that there can be no doubt the company will be constantly on the increase for a long time to come.

Still another advantage, not to be overlooked, which pertains to no other truly valuable watering place, except Saratoga, is a large stationary population of nearly 4000 inhabitants, which prevents that sense of loneliness and desertion after the fashionables retire, which is keenly felt by the last who linger at any other spring. On account of the facilities of rail roads, the season commences about the first of May and lasts quite into October. For some invalids September is far better than the hot and crowded month of August. Even in winter, on account of the ready means of approach, the travelling sick can make a call at Saratoga. The baths are believed to be as valuable in the depth of winter as in the heat of summer. Bath owners, it is understood, propose to keep their establishments open through the cold weather. Our rheumatic and gouty friends may derive immense benefit from this kind of medication. It is not impossible that this class of unfortunates may yet make their fashionable season in the depth of winter, at Saratoga. We entertain the highest expectations in regard to the effects of hot mineral baths in these two very painful maladies.

Thus, we have freely expressed an individual preference, which may not precisely accord with the opinions of all our professional brethren; the real value, however, of the comforts appertaining to Saratoga, to say nothing of its sparkling fountains, will not be considered over estimated by gentlemen who have visited all the essential springs in the Union.

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*Practical Instruction in Animal Magnetism.*—As long ago as 1837, Thomas C. Hartshorn, Esq., a gentleman of literary and scientific taste, translated the work of J. P. F. Deleuze, on this subject, from the French—to which were appended a vast many notes and observations, the result of much industrious inquiry among physicians and others, in regard to animal magnetism. He has now produced a revised edition, considerably enlarged by what he considers new facts. The design of Deleuze was to

keep Mesmerism in the hands of the profession, and his object has been favored throughout the appendix, for the translator has some apprehensions that physicians will not duly appreciate the importance of rescuing the subject from the constrictor embrace of ignorant pretenders. Mr. Hartshorn says, so far as he is able to judge, people are inclined to try its remedial effects, whenever recommended by proper authority.

The translator is an honest man—a gentleman for whom we entertain a high personal regard; and because his claims are based on genuine worth of character, whatever comes from his pen will receive respectful consideration. We shall not attempt, however, to conceal our views of animal magnetism, or the impostors and vagabonds who are its principal advocates and expounders in New England. It amounts almost to degradation to be identified with the practice as served up before gaping crowds of ignoramuses, throughout the length and breadth of the country. Those who were disposed, at one time, to pursue a philosophical inquiry, and show its truths, if it had any, were disgusted, and gave up in utter despair. It is the handy engine of unprincipled, lazy, knavish, ignorant, travelling nuisances, who pick up pennies by it, because they can do it more easily than by any regular, honest employment. Without wishing to provoke a controversy with those whose organ of credulity is larger than our own, we cheerfully recommend to them this translation, with a hope that it will correct some of their errors of judgment, and conduce to the promotion of inductive science.

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*Medical College of Richmond, Va.*—Jeffries Wyman, M.D., of this city, has received the appointment of Professor of Anatomy and Physiology in this flourishing institution. The lectures commence about the first of November, and continue, it is said, three months.

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*Columbian College.*—Benjamin Hallowell, Esq., a distinguished chemist, late of Alexandria, D. C., has been appointed Professor of Chemistry in the Medical Department of Columbian College, Washington city, in the place of the late Dr. Hall. He is an able lecturer, and a gentleman of very extensive scientific attainments.

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*Officers of the Bennington Co. (Vt.) Medical Society, for the Year 1843-4:*—Herman Tucker, *President*.

F. B. Morgan, *Vice President*.

John Cooke, *Secretary*.

F. Johnson, *Corresponding Secretary*.

Amariah Benson, *Treasurer*.

*Censors.*—F. Johnson, A. Lock, J. Cooke.

*Librarian.*—Luther Mosley.

*Delegates to State Medical Society.*—F. B. Morgan, L. Mosley.

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*Boston Medical Police.*—A pamphlet, containing the rules and regulations of the Boston Medical Association, was distributed last week, comprising a correct catalogue of members, from its formation in 1806 to June, 1843—321 in all. Of these, 73 have died; 18 left the practice;

101 left the city. Of this latter number, many have since died. The profession, however, is constantly on the increase in this and all other large towns and cities—wholly beyond the wants of the public.

*Medical Staff of the Navy.*—A letter is published in the *Journal* to-day, which sets forth the grievances and degradations of Assistant Surgeons of the U. S. Navy. Some remedy should be devised for bettering their condition on shipboard; this is certainly required as an act of justice. It will be difficult, by and by, to find candidates for that service, if they are not even respected by their inferiors.

*Management of the Insane.*—The reader is referred to an article commencing at page 133 in to-day's *Journal*, on a subject of much importance—too long to have place in the editorial department of the *Journal*, where, perhaps, it legitimately belongs.

*Medical Miscellany.*—Assistant Surgeon Dr. Marius Duvall, has gone out in the U. S. Schooner *Phoenix*, bound to the Pacific Ocean.—A negro woman, nearly 50, belonging to a Creole family in the Parish of St. Landry, Louisiana, has had thirty-five children. She was 20 when the first was born. She gave birth to twins five times, triplets three times, and has twenty children now living.—Dr. Richard Wayne, of Savannah, was shot at in the street, recently, and wounded, but is likely to recover.—Dr. Zina Pitcher, of Wayne, Michigan, has been nominated for Governor of that State.—Dr. Mott, of New York, has been elected an honorary member of the Royal Academy of Sciences of Belgium.—A tract has been written in England on the evils of late hours in business—its causes and its cures. The author had better begin with the British Parliament for his first patient.—An edition of Dr. Dickson's *Fallacies of the Faculty*, is published for the people. They understood them pretty well before.—A treatise on the treatment of pulmonary consumption with Naphtha, by John Hastings, M.D., seems to take better with the public than the naphtha is taken by his patients.—Mobile is unusually healthful for the season.

TO CORRESPONDENTS.—Professor Lindsly's paper on leucorrhœa has been received, and will have an insertion next week.

MARRIED.—At Sandwich, Dr. David T. Huckins to Miss Sarah F., daughter of Dr. C. White, all of S.

DIED.—At Peekskill, N. Y., Dr. Nehemiah Brush, 57.—At New Orleans, Dr. John Nichols.—At Stowe, Mass., Dr. Rand.—In the Parish of St. John, La., Dr. Thomas Norvell, post-master.

Number of deaths in Boston, for the week ending Sept. 16, 49.—Males, 30—Females, 19. Stillborn, 3. Of consumption, 7—dysentery, 4—cholera infantum, 4—bowel complaint, 3—dropsy on the brain, 2—hooping cough, 1—croup, 1—inflammation of the lungs, 2—infantile, 1—old age, 3—accidental, 1—erysipelas, 1—lung fever, 2—teething, 1—suffocation, 1—marasmus, 3—inflammation of the brain, 1—cholera morbus, 1—palsy, 1—epilepsy, 1—apoplexy, 1—fever, 1—measles, 1—congestion of the brain, 1—influenza, 1—child-bed, 1—canker, 1—unknown, 1.

Under 5 years, 37—between 5 and 20 years, 5—between 20 and 60 years, 13—over 60 years, 4.

*Man a Ruminating Animal.*—"I knew, many years ago (says Sir H. Marsh, who recounts several similar cases also), a remarkable example of rumination in a gentleman who was a clerk in a bank. He enjoyed good health, lived at his desk, took but little exercise, and dined hurriedly, scarcely allowing himself time to masticate his food. Soon after dinner, portions of food, with little or no effort on his part, ascended into his mouth, were re-masticated and again swallowed. In this manner, according to his own account, the whole of the food he had taken underwent this secondary process. It was a source of much enjoyment to him, and he prided himself upon the possession of this novel, but not very enviable, capability."

"Ill blows the wind that profits nobody,"

says Shakspeare, and we have an illustration of its truth in this—that to the above kind of affection we are likely to be indirectly indebted for a useful scientific work. Sir Henry Marsh enumerates, among other cases, that of a physician in extensive practice in a large rural district in Ireland, but who, having become subject to this regurgitation, had determined to seek recovery in absence from professional labors. He is now travelling about from place to place in quest of health, and having resolved to visit and examine every remarkable spa in Ireland, there is reason to expect that a valuable work will grow out of this tour of health, by Dr. A. K.

"This form of disease is generally traceable to long-continued mental anxieties; to over-thoughtful, studious, sedentary, and solitary habits; to the swallowing of food hastily without sufficient mastication and insalivation; to the utter neglect of the two most excellent promoters of healthy digestion—cheerful society, and full, free, enjoyable muscular exercise.

... I have generally found it useful to advise for the patient the recumbent position for an hour or more after each meal; to eat slowly, and to masticate well the food; to eat less than the appetite demands; and to be abstinent in the proportion of fluids, so as to avoid distension of the stomach."—*Sir Henry Marsh on Regurgitation, Dublin Journal.*

*Muriate of Quinine.*—The ordinary mode of obtaining this salt has hitherto been by decomposing the sulphate of quinine by muriate of baryta, but Signor Pagani, an Italian chemist, has lately found means to procure it by the aid of a substance destitute of the poisonous quality of a barytic salt. He dissolves one part by weight of neutral sulphate of quinia in 9 parts of boiling alcohol, sp. gr. 8.850. To this he adds another solution of three parts of dry common salt in 18 parts of hot water, and boils the whole. On adding now 20 parts of water, crystals of muriate of quinine are found thrown down, and additional crystals, in all making a quantity nearly equal to that of the sulphate employed, are obtained by the distillation and evaporation of the mother liquid, by which process, also, the alcohol previously employed is re-obtained. The muriate formed in this way is white and transparent, more readily soluble than the sulphate in both water and alcohol, neutral, and its solution is not rendered turbid by the addition of muriate of baryta. A muriate of quinia is also procured by boiling one part by weight of sulphate of quinine with 40 parts of water, and 3 parts of chloride of sodium in 18 parts of water, then mixing and evaporating these solutions. The salt thus obtained differs from the foregoing in being in lenticular and compact (dull?) crystals, instead of needle-shaped and iridescent ones, such as those produced by the first-detailed process.—*Giorn. per Serv. ai Progressi, &c.*